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Federal Communications Commission  
Office of the Secretary

June 4, 1992

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Ms. Donna R. Searcy  
Federal Communications Commission  
1919 M Street, N.W. - Room 222  
Washington, DC 20554

FCC MAIL BRANCH

Re: **Comments of International Mobile Machines Corporation (IMM)**  
**in ET Docket 92-9.**

Dear Madam Secretary:

Transmitted herewith are an original and nine copies of IMM's  
comments in the above referenced proceeding.

If you have any questions with regard to this matter, please do  
not hesitate to contact me.

Sincerely,

  
George Calhoun  
Senior Vice President

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Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, D.C. 20554

Federal Communications Commission  
Office of the Secretary

In the Matter of  
  
Redevelopment of Spectrum to  
Encourage Innovation in the  
Use of New Telecommunications  
Technologies

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) ET Docket No. 92-9  
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JUN 5 1992

FCC MAIL BRANCH

**COMMENTS OF INTERNATIONAL MOBILE MACHINES.**

**I. INTRODUCTION**

International Mobile Machines ("IMM") respectfully submits these comments in the above captioned proceeding. IMM is a wireless technology manufacturer that has developed an advanced, spectrum efficient digital radio system currently in use providing wireless loops between telephone central offices and customer premises. The system, called the Ultraphone, is based on digital Time Division Multiple Access (TDMA) techniques which allow multiple users simultaneously to share a single radio channel. The service is provided by telephone companies under the Commission's Basic Exchange Telecommunications Radio Service (BETRS) rules\* governing radio in the local loop. BETRS is provided primarily in rural areas. In these areas, frequency availability and favorable radio vs. wire economics encourage

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\* 47 CFR, Section 22.600

the use of radio. BETRS has not been available in urban areas mainly because of the lack of authorized frequencies.

## II. DISCUSSION

In this Notice of Proposed Rulemaking (NPRM), the FCC proposes to reallocate 220 MHz of spectrum between 1.85 and 2.20 Ghz for new and emerging technologies. The specific frequencies proposed are 1.85 - 1.99, 2.11 - 2.15 and 2.16 - 2.20 GHz. This proceeding further proposes to establish the emerging technologies band for use by new services or the expansion of existing services. In the notice the FCC said: "We anticipate that the first use of these emerging technology bands will be for the creation of a new personal communications service (PCS)." \*

However, the Commission should be mindful that PCS is not a monolithic, single service but a description of numerous and diverse wireless services which will develop separately from the allocations of spectrum in the emerging technologies band. These wireless services will be a mixture of private and public applications serving residence, office and public wireless access needs. Each application will evolve separately within the family of personal communications services, with its own technology optimized to the specific application.

PCS services have been generally defined by Telocator's PCS section as: Telepoint (one-way calling), Advanced Telepoint (two-way calling), Personal Telecommunications Service (PTS) and Advanced Cordless/Wireless Business. The Telepoint service is a

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\*\* NPRM, ET Docket 92-9, pg.14

stand-alone single point base station which provides multiple radio channels for one or two-way access into the public switched network -- it has been described as a multi-channel wireless payphone. PTS identifies a broader concentration of microcells providing area-wide capabilities with intelligent network functions and hand-off from cell to cell. Advanced Cordless/Wireless comprise both office and residential systems.

The licensing and regulatory treatment of each service will probably follow the current regulatory treatment of the wired equivalent. Accordingly, the office and residence systems, which are naturally non-licensed private systems, will probably stay non-licensed under some modified Part 16 structure. Conversely the Telepoint and PTS are obviously public, common carrier-like licensed services. As such, they will be subject to FCC licensing and a variety of regulation at the state level.

One wireless application that has received little attention, but potentially could become, at least initially, the most important wireless service is the wireless local loop (WLL) -- the provision of plain old telephone service (POTS) using radio. Local exchange carriers (LECs) have had nearly 5 years of experience in using radio in the loop under the BETRS service definition and rules, but, as noted earlier, spectrum shortages have kept BETRS from being offered in urban areas.

The advantages of radio in the loop are well known: reduction in the cost of loop provisioning and rehabilitation, potential for quick installation, establishment of temporary and

emergency services, and cost effective deployment of redundant capabilities (911 and dual wire center homing). However, without a clear allocation of spectrum for an urban BETRS -- WLL will not be implemented soon nor will the resulting advantage of radio in the loop reach the residential customer until long after the more lucrative high use business customer base has been fully satisfied.

In all discussions of PCS the residential loop customer has been ignored. PCS has been described in several ways: as a competitive service to cellular radio, as a niche service competing with or enhancing wired payphones or later as a competitive service for the wired loop -- especially for the more lucrative business service. IMM believes PCS will be all those things. In the earliest deployment of PCS the Telepoint applications will in fact serve niche markets in competition with and complementary to wired payphones. The more ambitious deployment of microcells -- PTS, each interconnected and controlled through a switching center will begin by cutting into and therefore competing with the portable sector of the cellular market. In the end however, as PCS matures, the proliferation of microcells will bring licensees into direct competition with the regulated monopoly telephone company for the business customer.

Full competition, however, which includes the basic exchange service to residential customers, will not be part of the PCS offerings mainly due to the nature of the pricing of the service. Until PCS matures to the point where it can provide ubiquitous competition to the LEC, PCS licensees will do what all other

competitive carriers have done.\* They will focus on the high volume business customer and leave the residential POTS customer to the regulated LEC. The LEC is the only participant who is willing and able to bring radio into the local loop for the provision of basic telephone service. Without a spectrum allocation the urban residential POTS customer will not be served by radio. This situation is especially significant in that rural POTS customers have had access to radio loops for five years.

Accordingly, the Commission should allocate a portion of the emerging technologies spectrum to WLL under the current BETRS rules for the provision of wireless local loops in urban areas. This allocation will not require long or lengthy regulatory proceedings to implement, nor should there be any concerns over competitive access to the spectrum. Current rules allow, with state utility commission approval, competitive access to the BETRS spectrum.\*\* As a result, competition in the provision of basic telephone service would be allowed (or disallowed) at a pace and scope that permits state utility commissions to moderate the overall impact on POTS pricing.

PCS, including the allocation of spectrum, the licensing process and participation is the subject of current regulatory proceedings in Docket 90-314. A major factor in the eventual licensing scheme in this proceeding will be the need to insure a

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\* Competitive access providers target the access transport portion of the local exchange. Other by-pass carriers target business portions of local exchange service.

\*\* 47 CFR Section 22.601 (a)(4)

competitive environment in the provisioning of wireless services. As such, it is predictable that the PCS licensees will base their strategies on the implementation of systems in "high-return" areas. Dense center-city locations in the top population centers will be the favorites of the early PCS pioneers. On-premise and public systems will proliferate in these areas.

Residential and neighborhood systems will have more difficulty achieving high penetration levels. These areas are currently served by a regulated monopoly LEC with a wired infrastructure. Although there is much activity in bringing competition into the local exchange, all such activity is focused on transport and access competition. For very good economic reasons, no such competition is discussed in relation to providing basic exchange service. The local loop is currently priced below cost to enable state regulators to hold down the cost of POTS. This situation mitigates against competitive PCS providers targeting the residential POTS market unless pricing closer to cost is allowed. To bring radio into the residential portion of the local loop in a systematic fashion the LEC must be provided spectrum within the regulated environment.

The LEC however, needs to be participate in all stages of PCS and I'm sure that most LECs, along with other participants, expect to compete in the deployment of PCS. However, as the provision of local loop service itself is highly regulated there needs to be a specific, and discrete allocation for this non-competitive portion of the service offering of the LEC.

A discrete allocation scheme would promote potential competition, advance the technology solutions by allowing PCS to get to the market quicker and insure a balanced regulatory environment between the provision of POTS and the provision of competitive PCS.

The following representative allocation would balance all the interests in the PCS proceeding. The location within the band is for illustrative purposes only. However, the allocations for the various types of PCS must be contiguous to capture the economies of manufacturing scale in the radio products.

1850-1890 = Wireless office systems (includes  
Residential cordless/WPBX/Wireless Centrex)

1890-1910 = Telepoint/Advanced telepoint

1910-1920 = WLL (urban BETRS)

1920-1965 = PTS

1965-1990 = PCS spectrum reserve

2110-2150 or 2160-2200 = Data PCS

The needed amount of spectrum allocation for the wireless office environment is better known than the other services. It has been studied by numerous organizations and a consensus is developing for about 40 MHz of spectrum.\* Next, the highly competitive PTS marketplace will need a significant amount of spectrum. A boundary upper limit of 25 MHz (the cellular allocation) seems reasonable.

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\* Hatfield and Associates conducted a study which analyzed the spectrum needs of PCS. Included in the analysis is a spectrum requirement for in-building services. Results of that study was provided to the FCC in a recent pioneer's preference filing for FMR Corp. (AMT).



However, the initial allocation should be more modest. This model assumes three licensees with 15 MHz each. If demand increases over time, then a further allocation from the reserve would be appropriate.

The WLL allocation is likewise modest. The very nature of the wired local loop dictates that wireless will be only a percentage of wired loops and various regulatory constraints (local loop depreciation schedules etc.) will ensure that radio penetration into the loop will only be allowed where economics, emergency replacement, redundancy or public safety dictates. Accordingly, 10 MHz should allow low-powered, closely spaced microcells to serve thousands of subscribers in a small area with a radio-based loop sized to the needs of the location and responsive to telephone quality standards normal for the industry.

Finally, the issue of data and voice sharing common spectrum must be addressed. Although low-speed data (< 256 KB/s) and voice are compatible, the higher-speed applications of data require separate allocations. During the En Banc proceeding, Dr. David Nagel, Apple Computer's Vice President-advanced technology made the case for separate spectrum for high speed data:

Current PCS experiments and proposals portray PCS as replicating the functions of the telephone in a portable form. This in a nutshell, is one of the most compelling reasons why personal data communications must have its own portion of the PCS spectrum. Modems used on today's telephone networks only recently have achieved useful data transmission rates in the range 9,600 to 19,200 bits per second. This is far less than the data transmission rates necessary to provide computer data connectivity consistent with the needs of today's users and the abilities of computers to acquire and manipulate data.

We agree and propose the Commission identify data PCS spectrum within the 220 MHz currently being discussed for emerging technologies.

## II. CONCLUSION

Until such a time as competition replaces the need for regulation of the local loop, it will be necessary to maintain a division of service definition, spectrum and of course pricing of the various PCS applications. To do this, each specific application of PCS requires a discrete allocation of spectrum.

The Commission can foster a brisk competitive marketplace by allocating discrete spectrum for the several manifestations of PCS. The in-building office systems, the various telepoint applications, the more broadly deployed public PTS and finally the WLL.

Radio has proven it can lower costs and increase service in the rural loop. It now needs a chance to do the same in the urban loop. In time, full and open competition will eliminate the WLL portion of PCS and competitive carriers will abound. However, until that day arrives, the Commission must not make the mistake of leaving the urban residential POTS customer without access to the advantage of radio in the loop.

Respectfully submitted,



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May 4, 1992